



07/30/14

Technical Report for

Stantec Consulting Services Inc.

Sunoco - Marcus Hook Facility, PA

213402353

Accutest Job Number: JB47863

Sampling Date: 09/19/13

Report to:

Stantec

Lisa.Votta@stantec.com

ATTN: Lisa Votta

Total number of pages in report: 30



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in black ink that reads 'Nancy Cole'.

Nancy Cole
Laboratory Director

Client Service contact: Marie Meidhof 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, OH VAP (CL0056), PA, RI, SC, TN, VA, WV, DoD ELAP (L-A-B L2248)

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Test results relate only to samples analyzed.

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Sample Summary

Stantec Consulting Services Inc.

Job No: JB47863

Sunoco - Marcus Hook Facility, PA
Project No: 213402353

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JB47863-1	09/19/13	09:00 JDR	09/19/13	SO	Soil	MW-482(0-2.0)
JB47863-2	09/19/13	10:20 JDR	09/19/13	SO	Soil	MW-482(2.0-4.0)
JB47863-3	09/19/13	10:35 JDR	09/19/13	SO	Soil	MW-482(4.0-5.5)

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Stantec Consulting Services Inc.

Job No JB47863

Site: Sunoco - Marcus Hook Facility, PA

Report Date 10/7/2013 10:23:04 A

On 09/19/2013, 3 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 1.1 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of JB47863 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix: SO

Batch ID: V2C5164

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB48042-5MS, JB48042-5MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- JB47863-3: Dilution required due to matrix interference.

Matrix: SO

Batch ID: V3C4609

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB48882-2MS, JB48882-3DUP were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- RPD(s) for Duplicate for Benzene, Ethylbenzene, Xylene (total) are outside control limits for sample JB48882-3DUP. High RPD due to low concentration of hit

Extractables by GCMS By Method SW846 8270D

Matrix: SO

Batch ID: OP69179

- All samples were extracted within the recommended method holding time.
- Sample(s) JB47862-1MS, JB47862-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Matrix Spike / Matrix Spike Duplicate Recovery(s) for Benzo(a)anthracene, Benzo(g,h,i)perylene are outside control limits. Outside control limits due to matrix interference.

Volatiles by GC By Method SW846 8011

Matrix: SO

Batch ID: M:OP35003

- The data for SW846 8011 meets quality control requirements.
- JB47863-1: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB47863-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB47863-3: Analysis performed at Accutest Laboratories, Marlborough, MA.

Metals By Method SW846 6010C

Matrix: SO

Batch ID: MP74944

- Sample(s) JB47906-10MS, JB47906-10MSD, JB47906-10SDL were used as the QC samples for metals.

Wet Chemistry By Method SM2540 G-97

Matrix: SO

Batch ID: GN91987

- The data for SM2540 G-97 meets quality control requirements.

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest New Jersey

Job No JB47863

Site: SECORPAE: Sunoco - Marcus Hook Facility, PA

Report Date 10/3/2013 10:53:42 AM

3 Sample(s) were collected on 09/19/2013 and were received at Accutest on 09/19/2013 properly preserved, at 1.9 Deg. C and intact. These Samples received an Accutest job number of JB47863. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GC By Method SW846 8011

Matrix SO

Batch ID: OP35003

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB47863-2MS, JB47863-2MSD were used as the QC samples indicated.
- JB47863-1,2,3 for Bromofluorobenzene (S): Outside control limits due to possible matrix interference.
- OP35003-MS/MSD for Bromofluorobenzene (S): Surrogate standard not added.
- OP35003-BS for Bromofluorobenzene (S): Analyte recovery satisfactory.
- OP35003-MB for Bromofluorobenzene (S): Samples are non-detect for analyte.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report (JB47863).

Summary of Hits

Job Number: JB47863
Account: Stantec Consulting Services Inc.
Project: Sunoco - Marcus Hook Facility, PA
Collected: 09/19/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JB47863-1 MW-482(0-2.0)

sec-Butylbenzene	1.1 J	4.1	0.093	ug/kg	SW846 8260B
tert-Butylbenzene	0.39 J	4.1	0.24	ug/kg	SW846 8260B
Cyclohexane	1.1 J	4.1	0.10	ug/kg	SW846 8260B
Hexane	1.7 J	4.1	0.20	ug/kg	SW846 8260B
Isopropylbenzene	1.0 J	4.1	0.061	ug/kg	SW846 8260B
Benzo(a)anthracene	29.7 J	35	11	ug/kg	SW846 8270D
Benzo(a)pyrene	30.4 J	35	11	ug/kg	SW846 8270D
Benzo(b)fluoranthene	28.4 J	35	12	ug/kg	SW846 8270D
Benzo(g,h,i)perylene	42.0	35	13	ug/kg	SW846 8270D
Benzo(k)fluoranthene	21.7 J	35	13	ug/kg	SW846 8270D
Chrysene	35.7	35	12	ug/kg	SW846 8270D
Fluoranthene	49.3	35	15	ug/kg	SW846 8270D
Fluorene	19.9 J	35	11	ug/kg	SW846 8270D
Indeno(1,2,3-cd)pyrene	21.2 J	35	12	ug/kg	SW846 8270D
Phenanthrene	39.7	35	16	ug/kg	SW846 8270D
Pyrene	62.0	35	13	ug/kg	SW846 8270D
Cobalt	10.0	5.5	0.073	mg/kg	SW846 6010C
Lead	22.4	2.2	0.24	mg/kg	SW846 6010C
Nickel	27.7	4.4	0.088	mg/kg	SW846 6010C
Vanadium	45.4	5.5	0.081	mg/kg	SW846 6010C

JB47863-2 MW-482(2.0-4.0)

Xylene (total)	0.32 J	1.1	0.15	ug/kg	SW846 8260B
sec-Butylbenzene	10.2	5.3	0.12	ug/kg	SW846 8260B
tert-Butylbenzene	5.2 J	5.3	0.31	ug/kg	SW846 8260B
Hexane	0.45 J	5.3	0.25	ug/kg	SW846 8260B
Isopropylbenzene	15.9	5.3	0.078	ug/kg	SW846 8260B
Acenaphthene	28.8 J	43	12	ug/kg	SW846 8270D
Fluorene	51.3	43	14	ug/kg	SW846 8270D
Phenanthrene	62.4	43	20	ug/kg	SW846 8270D
Pyrene	28.1 J	43	16	ug/kg	SW846 8270D
Cobalt	8.8	5.1	0.067	mg/kg	SW846 6010C
Lead	9.5	2.0	0.22	mg/kg	SW846 6010C
Nickel	24.4	4.1	0.080	mg/kg	SW846 6010C
Vanadium	28.1	5.1	0.074	mg/kg	SW846 6010C

JB47863-3 MW-482(4.0-5.5)

sec-Butylbenzene ^a	273 J	570	21	ug/kg	SW846 8260B
tert-Butylbenzene ^a	112 J	570	19	ug/kg	SW846 8260B
Isopropylbenzene ^a	380 J	570	17	ug/kg	SW846 8260B
Acenaphthene	235	40	12	ug/kg	SW846 8270D

Summary of Hits

Job Number: JB47863
Account: Stantec Consulting Services Inc.
Project: Sunoco - Marcus Hook Facility, PA
Collected: 09/19/13

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Anthracene		75.3	40	14	ug/kg	SW846 8270D
Benzo(a)pyrene		60.7	40	12	ug/kg	SW846 8270D
Benzo(b)fluoranthene		18.8 J	40	13	ug/kg	SW846 8270D
Benzo(g,h,i)perylene		42.5	40	15	ug/kg	SW846 8270D
Diethyl phthalate		169	80	14	ug/kg	SW846 8270D
Fluoranthene		67.4	40	18	ug/kg	SW846 8270D
Fluorene		425	40	13	ug/kg	SW846 8270D
Phenanthrene		1130	40	18	ug/kg	SW846 8270D
Pyrene		483	40	15	ug/kg	SW846 8270D
Cobalt		8.3	5.1	0.067	mg/kg	SW846 6010C
Lead		6.1	2.0	0.22	mg/kg	SW846 6010C
Nickel		14.4	4.0	0.080	mg/kg	SW846 6010C
Vanadium		30.7	5.1	0.074	mg/kg	SW846 6010C

(a) Dilution required due to matrix interference.

Sample Results

Report of Analysis

Report of Analysis

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Client Sample ID:	MW-482(0-2.0)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-1	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	93.0
Method:	SW846 8260B		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3C103429.D	1	10/02/13	TS	n/a	n/a	V3C4609
Run #2							

Run #	Initial Weight
Run #1	6.6 g
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.81	0.097	ug/kg	
108-88-3	Toluene	ND	0.81	0.086	ug/kg	
100-41-4	Ethylbenzene	ND	0.81	0.21	ug/kg	
1330-20-7	Xylene (total)	ND	0.81	0.11	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.81	0.19	ug/kg	
135-98-8	sec-Butylbenzene	1.1	4.1	0.093	ug/kg	J
98-06-6	tert-Butylbenzene	0.39	4.1	0.24	ug/kg	J
110-82-7	Cyclohexane	1.1	4.1	0.10	ug/kg	J
107-06-2	1,2-Dichloroethane	ND	0.81	0.11	ug/kg	
110-54-3	Hexane	1.7	4.1	0.20	ug/kg	J
98-82-8	Isopropylbenzene	1.0	4.1	0.061	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	ND	4.1	0.17	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	4.1	0.13	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	90%		59-130%
17060-07-0	1,2-Dichloroethane-D4	90%		65-123%
2037-26-5	Toluene-D8	94%		80-124%
460-00-4	4-Bromofluorobenzene	91%		71-132%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	MW-482(0-2.0)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-1	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	93.0
Method:	SW846 8270D SW846 3550C		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P700.D	1	10/01/13	KR	09/23/13	OP69179	E6P29
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	170	58	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	700	42	ug/kg	
95-48-7	2-Methylphenol	ND	70	40	ug/kg	
	3&4-Methylphenol	ND	70	44	ug/kg	
100-02-7	4-Nitrophenol	ND	350	59	ug/kg	
108-95-2	Phenol	ND	70	37	ug/kg	
83-32-9	Acenaphthene	ND	35	10	ug/kg	
120-12-7	Anthracene	ND	35	12	ug/kg	
56-55-3	Benzo(a)anthracene	29.7	35	11	ug/kg	J
50-32-8	Benzo(a)pyrene	30.4	35	11	ug/kg	J
205-99-2	Benzo(b)fluoranthene	28.4	35	12	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	42.0	35	13	ug/kg	
207-08-9	Benzo(k)fluoranthene	21.7	35	13	ug/kg	J
92-52-4	1,1'-Biphenyl	ND	70	4.0	ug/kg	
218-01-9	Chrysene	35.7	35	12	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	35	12	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	70	7.7	ug/kg	
84-66-2	Diethyl phthalate	ND	70	12	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	70	31	ug/kg	
206-44-0	Fluoranthene	49.3	35	15	ug/kg	
86-73-7	Fluorene	19.9	35	11	ug/kg	J
193-39-5	Indeno(1,2,3-cd)pyrene	21.2	35	12	ug/kg	J
91-57-6	2-Methylnaphthalene	ND	70	19	ug/kg	
91-20-3	Naphthalene	ND	35	9.5	ug/kg	
85-01-8	Phenanthrene	39.7	35	16	ug/kg	
129-00-0	Pyrene	62.0	35	13	ug/kg	
110-86-1	Pyridine	ND	70	14	ug/kg	
91-22-5	Quinoline	ND	170	33	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	89%		13-110%

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID:	MW-482(0-2.0)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-1	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	93.0
Method:	SW846 8270D SW846 3550C		
Project:	Sunoco - Marcus Hook Facility, PA		

ABN Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	102%		15-110%
118-79-6	2,4,6-Tribromophenol	100%		20-123%
4165-60-0	Nitrobenzene-d5	93%		10-110%
321-60-8	2-Fluorobiphenyl	86%		17-110%
1718-51-0	Terphenyl-d14	92%		30-124%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	MW-482(0-2.0)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-1	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	93.0
Method:	SW846 8011 SW846 3550B		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BB51262.D	1	10/01/13	AMA	09/29/13	M:OP35003	M:GBB3022
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	2.6	0.98	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	243% ^b		61-167%		
460-00-4	Bromofluorobenzene (S)	106%		61-167%		

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Outside control limits due to possible matrix interference.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: MW-482(0-2.0)	Date Sampled: 09/19/13
Lab Sample ID: JB47863-1	Date Received: 09/19/13
Matrix: SO - Soil	Percent Solids: 93.0
Project: Sunoco - Marcus Hook Facility, PA	

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	10.0	5.5	0.073	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²
Lead	22.4	2.2	0.24	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²
Nickel	27.7	4.4	0.088	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²
Vanadium	45.4	5.5	0.081	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²

(1) Instrument QC Batch: MA32312

(2) Prep QC Batch: MP74944

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Report of Analysis

Page 1 of 1

Client Sample ID:	MW-482(2.0-4.0)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-2	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	74.0
Method:	SW846 8260B		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3C103430.D	1	10/02/13	TS	n/a	n/a	V3C4609
Run #2							

Run #	Initial Weight
Run #1	6.4 g
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.1	0.13	ug/kg	
108-88-3	Toluene	ND	1.1	0.11	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.28	ug/kg	
1330-20-7	Xylene (total)	0.32	1.1	0.15	ug/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	1.1	0.25	ug/kg	
135-98-8	sec-Butylbenzene	10.2	5.3	0.12	ug/kg	
98-06-6	tert-Butylbenzene	5.2	5.3	0.31	ug/kg	J
110-82-7	Cyclohexane	ND	5.3	0.13	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.1	0.14	ug/kg	
110-54-3	Hexane	0.45	5.3	0.25	ug/kg	J
98-82-8	Isopropylbenzene	15.9	5.3	0.078	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.3	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.3	0.17	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	88%		59-130%
17060-07-0	1,2-Dichloroethane-D4	86%		65-123%
2037-26-5	Toluene-D8	95%		80-124%
460-00-4	4-Bromofluorobenzene	85%		71-132%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	MW-482(2.0-4.0)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-2	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	74.0
Method:	SW846 8270D SW846 3550C		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P684.D	1	10/01/13	KR	09/23/13	OP69179	E6P29
Run #2							

Run #	Initial Weight	Final Volume
Run #1	31.5 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	210	72	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	860	52	ug/kg	
95-48-7	2-Methylphenol	ND	86	49	ug/kg	
	3&4-Methylphenol	ND	86	54	ug/kg	
100-02-7	4-Nitrophenol	ND	430	73	ug/kg	
108-95-2	Phenol	ND	86	45	ug/kg	
83-32-9	Acenaphthene	28.8	43	12	ug/kg	J
120-12-7	Anthracene	ND	43	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	43	14	ug/kg	
50-32-8	Benzo(a)pyrene	ND	43	13	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	43	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	43	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	43	16	ug/kg	
92-52-4	1,1'-Biphenyl	ND	86	5.0	ug/kg	
218-01-9	Chrysene	ND	43	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	43	15	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	86	9.5	ug/kg	
84-66-2	Diethyl phthalate	ND	86	15	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	86	38	ug/kg	
206-44-0	Fluoranthene	ND	43	19	ug/kg	
86-73-7	Fluorene	51.3	43	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	43	15	ug/kg	
91-57-6	2-Methylnaphthalene	ND	86	24	ug/kg	
91-20-3	Naphthalene	ND	43	12	ug/kg	
85-01-8	Phenanthrene	62.4	43	20	ug/kg	
129-00-0	Pyrene	28.1	43	16	ug/kg	J
110-86-1	Pyridine	ND	86	17	ug/kg	
91-22-5	Quinoline	ND	210	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	89%		13-110%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID:	MW-482(2.0-4.0)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-2	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	74.0
Method:	SW846 8270D SW846 3550C		
Project:	Sunoco - Marcus Hook Facility, PA		

ABN Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	107%		15-110%
118-79-6	2,4,6-Tribromophenol	113%		20-123%
4165-60-0	Nitrobenzene-d5	99%		10-110%
321-60-8	2-Fluorobiphenyl	106%		17-110%
1718-51-0	Terphenyl-d14	98%		30-124%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	MW-482(2.0-4.0)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-2	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	74.0
Method:	SW846 8011 SW846 3550B		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BB51253.D	1	10/01/13	AMA	09/29/13	M:OP35003	M:GBB3022
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	3.3	1.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	217% ^b		61-167%
460-00-4	Bromofluorobenzene (S)	114%		61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Outside control limits due to possible matrix interference.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: MW-482(2.0-4.0)	Date Sampled: 09/19/13
Lab Sample ID: JB47863-2	Date Received: 09/19/13
Matrix: SO - Soil	Percent Solids: 74.0
Project: Sunoco - Marcus Hook Facility, PA	

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	8.8	5.1	0.067	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²
Lead	9.5	2.0	0.22	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²
Nickel	24.4	4.1	0.080	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²
Vanadium	28.1	5.1	0.074	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²

(1) Instrument QC Batch: MA32312

(2) Prep QC Batch: MP74944

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Report of Analysis

Page 1 of 1

Client Sample ID:	MW-482(4.0-5.5)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	77.3
Method:	SW846 8260B		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2C112151.D	1	10/03/13	DR	n/a	n/a	V2C5164
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.5 g	10.0 ml	100 ul
Run #2			

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	110	14	ug/kg	
108-88-3	Toluene	ND	110	16	ug/kg	
100-41-4	Ethylbenzene	ND	110	20	ug/kg	
1330-20-7	Xylene (total)	ND	110	20	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	110	39	ug/kg	
135-98-8	sec-Butylbenzene	273	570	21	ug/kg	J
98-06-6	tert-Butylbenzene	112	570	19	ug/kg	J
110-82-7	Cyclohexane	ND	570	29	ug/kg	
107-06-2	1,2-Dichloroethane	ND	110	37	ug/kg	
110-54-3	Hexane	ND	570	62	ug/kg	
98-82-8	Isopropylbenzene	380	570	17	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	ND	570	18	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	570	25	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		59-130%
17060-07-0	1,2-Dichloroethane-D4	105%		65-123%
2037-26-5	Toluene-D8	112%		80-124%
460-00-4	4-Bromofluorobenzene	97%		71-132%

(a) Dilution required due to matrix interference.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID:	MW-482(4.0-5.5)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	77.3
Method:	SW846 8270D SW846 3550C		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P685.D	1	10/01/13	KR	09/23/13	OP69179	E6P29
Run #2							

Run #	Initial Weight	Final Volume
Run #1	32.5 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	200	67	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	800	49	ug/kg	
95-48-7	2-Methylphenol	ND	80	45	ug/kg	
	3&4-Methylphenol	ND	80	51	ug/kg	
100-02-7	4-Nitrophenol	ND	400	67	ug/kg	
108-95-2	Phenol	ND	80	42	ug/kg	
83-32-9	Acenaphthene	235	40	12	ug/kg	
120-12-7	Anthracene	75.3	40	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	13	ug/kg	
50-32-8	Benzo(a)pyrene	60.7	40	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	18.8	40	13	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	42.5	40	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	15	ug/kg	
92-52-4	1,1'-Biphenyl	ND	80	4.6	ug/kg	
218-01-9	Chrysene	ND	40	13	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	14	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	80	8.8	ug/kg	
84-66-2	Diethyl phthalate	169	80	14	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	80	35	ug/kg	
206-44-0	Fluoranthene	67.4	40	18	ug/kg	
86-73-7	Fluorene	425	40	13	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	40	14	ug/kg	
91-57-6	2-Methylnaphthalene	ND	80	22	ug/kg	
91-20-3	Naphthalene	ND	40	11	ug/kg	
85-01-8	Phenanthrene	1130	40	18	ug/kg	
129-00-0	Pyrene	483	40	15	ug/kg	
110-86-1	Pyridine	ND	80	16	ug/kg	
91-22-5	Quinoline	ND	200	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	81%		13-110%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID:	MW-482(4.0-5.5)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	77.3
Method:	SW846 8270D SW846 3550C		
Project:	Sunoco - Marcus Hook Facility, PA		

ABN Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	94%		15-110%
118-79-6	2,4,6-Tribromophenol	98%		20-123%
4165-60-0	Nitrobenzene-d5	90%		10-110%
321-60-8	2-Fluorobiphenyl	101%		17-110%
1718-51-0	Terphenyl-d14	88%		30-124%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	MW-482(4.0-5.5)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	77.3
Method:	SW846 8011 SW846 3550B		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BB51263.D	1	10/01/13	AMA	09/29/13	M:OP35003	M:GBB3022
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	3.2	1.2	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	223% ^b		61-167%		
460-00-4	Bromofluorobenzene (S)	116%		61-167%		

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Outside control limits due to possible matrix interference.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	MW-482(4.0-5.5)	Date Sampled:	09/19/13
Lab Sample ID:	JB47863-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	77.3
Project:	Sunoco - Marcus Hook Facility, PA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	8.3	5.1	0.067	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²
Lead	6.1	2.0	0.22	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²
Nickel	14.4	4.0	0.080	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²
Vanadium	30.7	5.1	0.074	mg/kg	1	10/01/13	10/05/13 ND	SW846 6010C ¹	SW846 3050B ²

(1) Instrument QC Batch: MA32312

(2) Prep QC Batch: MP74944

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Chain of Custody (Accutest Labs of New England, Inc.)

2235 Route 130, Dayton, NJ 08810
TEL: 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # JB47863	

Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)		Matrix Codes	
Company Name STANTEC		Project Name MARCUS Hook MW-482					
Street Address 1840 ANDREW DR		Street					
City State Zip WEST CHESTER 19380		City State					
Project Contact JENNIFER MENGES		Project # 213402353					
Phone # Fax # 610-840-2540 610-840-2540		Client Purchase Order #					
Sampler(s) Name(s) JEREMY RICHTER 210-540-7306		Project Manager					
Field ID / Point of Collection		Collection					
Account Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles
1	MW-482 (Q-2.0)		9/19/13	0900	90R	SO	5
2	MW-482 (Q-4.0)		9/19/13	1020	90R	SO	5
3	MW-482 (Q-5.5)		9/19/13	1035	90R	SO	5

8260 - VOC's
8270 - SVOC's
841 - EDB
6010 - METALS

D.I. slurry voc vials frozen storage
Date: 9/19/13 Time: 2:40 Initials: DR

Turnaround Time (Business days)		Data Deliverable Information		Comments / Special Instructions	
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY <input type="checkbox"/> other		Approved By (Accutest PM): / Date: Rec'd at Exton Service Center 9/19/13		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULLY1 (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input checked="" type="checkbox"/> EDD Format EQV15 <input type="checkbox"/> Other	
Emergency & Rush TIA data available VIA Lablink		Commercial "A" = Results Only Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		# PADEP SERO CRUDE OIL PARAMETERS FOR CORRECTIVE ACTION # LEAD AND UNLEADED GASOLINE AND NO. 2, 4, 5, 6 FUEL OILS	

Relinquished by Sampler		Date Time		Received By		Date Time	
1	<i>[Signature]</i>	9/19/13	1525	1	<i>[Signature]</i>	9/19/13	1615
3	<i>[Signature]</i>	9/19/13	1710	3	<i>[Signature]</i>		
5	<i>[Signature]</i>			5	<i>[Signature]</i>		

Custody Seal # ☐ Intact ☐ Not intact Preserved where applicable ☐ On Ice ☒ Cooler Temp. **1.1C-10**

5.1
5

JB47863: Chain of Custody

Page 1 of 3

JB47863

SAMPLE #	MEOH VIAL	DI VIAL	DI VIAL
1	3946	3986	3987
2	3952	3998	3999
3	3964	4022	4023
4			
5			
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Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JB47863 **Client:** _____ **Project:** _____
Date / Time Received: 9/19/2013 **Delivery Method:** _____ **Airbill #s:** _____
Cooler Temps (Initial/Adjusted): #1: (1.1/1.1); 0

Cooler Security

	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Cooler Temperature

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservation

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Sample Integrity - Documentation

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Sample Integrity - Condition

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	Intact		

Sample Integrity - Instructions

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

2235 Route 130, Dayton, NJ 08810
TEL: 732-329-0200 FAX: 732-329-3499/3480
www.acutest.com

[illegible]

JB47863: Chain of Custody
Page 1 of 2
Accutest Labs of New England, Inc.

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JB47863 **Client:** ACNJ **Immediate Client Services Action Required:** No
Date / Time Received: 9/21/2013 **Delivery Method:** **Client Service Action Required at Login:** No
Project: SUB **No. Coolers:** 1 **Airbill #'s:**

Cooler Security **Y or N** **Y or N**
1. Custody Seals Present: ☒ ☐ 3. COC Present: ☒ ☐
2. Custody Seals Intact: ☒ ☐ 4. Smpl Dates/Time OK ☒ ☐

Cooler Temperature **Y or N**
1. Temp criteria achieved: ☒ ☐
2. Cooler temp verification: Infrared gun
3. Cooler media: Ice (bag)

Quality Control Preservation **Y** **or** **N** **N/A**
1. Trip Blank present / cooler: ☐ ☐ ☒
2. Trip Blank listed on COC: ☐ ☐ ☒
3. Samples preserved properly: ☒ ☐
4. VOCs headspace free: ☐ ☐ ☒

Sample Integrity - Documentation **Y or N**
1. Sample labels present on bottles: ☒ ☐
2. Container labeling complete: ☒ ☐
3. Sample container label / COC agree: ☒ ☐

Sample Integrity - Condition **Y or N**
1. Sample recvd within HT: ☒ ☐
2. All containers accounted for: ☒ ☐
3. Condition of sample: Intact

Sample Integrity - Instructions **Y** **or** **N** **N/A**
1. Analysis requested is clear: ☒ ☐
2. Bottles received for unspecified tests: ☐ ☒
3. Sufficient volume recvd for analysis: ☒ ☐
4. Compositing instructions clear: ☐ ☐ ☒
5. Filtering instructions clear: ☐ ☐ ☒

Comments